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ABSTRACT

The purpose of this study was two-fold: (1) to determine whether alcoholics will show greater persistance in responding under punishment in a simple operant task as compared to nonalcoholics; and (2) with this task, under what conditions alcoholics will suppress their responses to the same extent as nonalcoholics. In the task, all subjects during acquisition received training with monetary reinforcers symbolizing rewarding aspects of drinking, followed by one of three extinction conditions symbolizing possible unpleasant aspects of drinking: (1) punishment only; (2) simultaneous reward-punishment; and (3) nonreward. The main finding was that following acquisition, alcoholics in the punishment-only and in the reward-punishment condition failed to suppress their responses to the same extent as the nonalcoholic controls. The author discusses implications for treatment procedures drawn from the conclusion that punishment is not an effective agent for the modification of behavior in alcoholics. (Author/LAA)

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The Effects of Varied Extinction Conditions Following Acquisition on a 100 Percent Rewarded Task in Alcoholics and Nonalcoholics

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(Paper presented at the annual meeting of the Midwestern Psychological Association, Detroit, May, 1971.)

Considering that alcoholics are typified by their persistence in a response which often has punishment associated with it (hangover, sickness), it would seem appropriate to investigate those learning situations in which punishment does not inhibit, but rather may facilitate the occurrence of a response. Recent theorizing by Martin (1963) and Banks (1966) suggests that pairing reward and intermittent punishment with the same goal response during acquisition will lead to greater resistance to extinction. Martin felt that punishing a response while at the same time rewarding it results in the classical conditioning of "anticipatory punishment responses" (usually termed fear or anxiety) associated with the approach response. Greater persistence during extinction would occur because of the motivating properties of an increase in activation or drive. A number of studies (Martin and Ross, 1964; Deur and Parke, 1968; Parke, Deur and Sawin, 1970) have supported this prediction.

One could consider alcoholic drinking as an instance of the more general paradigm in which a discriminative stimulus (alcohol) has both approach and avoidance characteristics. To the alcoholic, the sight of alcohol has come to be associated with frustration and anxiety since it has both rewarding and punishing cue characteristics. That is, alcohol can be thought

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of as a discriminative stimulus for both reward (e.g. tension reduction) and punishment (e.g. hangover, sickness). In the alcoholic, the anxiety associated with this conflict may be mitigated by alcohol consumption (Menaker, 1967). Since reduction in fear and frustration is reinforcing, the drinking habit is strenghtened. Once established, the excessive drinking behavior is relatively more resistant to extinction in the alcoholic, because of the facilitating effect of anticipatory punishment responses which increase drive level. In contrast, other etiological theories of alcoholism contend that pathological drinking occurs either because of some personality deficit in the alcoholic (Sutherland, Schroeder and Tordella, 1950; Walton, 1968), or that alcohol acts as an agent to reduce externally derived unpleasant arousal states (Masserman and Yum, 1946; Smart, 1965a, 1965b, 1968).

Since typically the life of an alcoholic is dominated by an external agent, alcohol, it would also seem useful to determine how alcoholics are represented on the Internal-External dimension of personality (Rotter, 1966). Because alcohol has a form of control over the alcoholic, one could hypothesize that excessive drinkers would tend to have more of an external locus of control than ordinary social drinkers. However, Goss and Morosko (1970) reported that alcoholics score higher on the internal orientation. Part of the present project was to further test the hypothesis that alcoholics have an internal orientation.

The purpose of the present study was two-fold: first, to determine whether alcoholics will show greater persistence in responding under punishment in a simple operant task as compared to nonalcoholics; and second, with this task under what conditions will alcoholics suppress their responses to the same extent as nonalcoholics. In the experimental task,

all subjects during acquisition received training with monetary reinforcers (nickels) in a 100 percent reinforcement schedule (symbolizing rewarding aspects of drinking), followed by one of three extinction conditions (symbolizing possible unpleasant aspects of excessive drinking): punishment only, simultaneous reward-punishment,and nonreward. The dependent variable was the number of responses the subject made during the extinction phase before he terminated the task. Based on the theoretical framework presented and on existing prior evidence, the following hypotheses were investigated: a) Excessive drinkers will show greater persistence in the punishment only condition than nonalcoholics; b) under simultaneous reward-punishment, alcoholics will show greater persistence than nonalcoholics under the same condition; c) for all subjects the simultaneous reward-punishment condition will lead to the least amount of response suppression; and d) irrespective of the subject group, there will be no difference in number of responses made in the punishment and nonreward conditions. On the personality measure of locus of control, it was hypothesized that alcoholics will show more of an internal orientation than nonalcoholics.

Method

The 30 male alcoholic Ss were obtained from Mendota State Hospital and the Madison General Hospital, in Madison, Wisconsin. The 30 non-alcoholic controls were male ambulatory patients from the Veterans Administration Hospital, Milwaukee, Wisconsin. The alcoholic Ss were all chronic patients with at least one previous admission for treatment of alcoholism (range 1 to 22 admissions, $\bar{x}$ = 8.0 admissions). Control and experimental Ss were matched for age, education and socioeconomic class.

The apparatus consisted of a three button operant response panel (Vogel-Sprott & Banks, 1965), a nickel reward dispenser, and a shock generator

with finger electrodes. On one corner of the response panel was a small white light E used to signal the onset of a trial. On the same circuit was a three light panel, visible only to E, which indicated the S's response sequence for each trial. S and E were separated by a plywood screen to eliminate visual contact.

At the beginning of the experimental session the S was administered the Internal-External Scale. Following completion of the test, the electrodes were attached to the fingers and S was introduced to the first part of the experiment. The S was first told that he would receive a test shock (2.0 m. amps) and was asked to rate the severity of the shock on a scale ranging from 1 to 5. The S was also asked to rate the "pleasantness" of a nickel on a similar scale and the shock was then varied to approximate the rating of the nickel. An effort was thus made to roughly equate the reinforcing value of a shock with the nickel. The E then read instructions (see Appendix A) to the S which essentially told the S that he would receive a nickel reward for pressing a correct sequence of three buttons and that occassionally he might receive a shock. The instructions also told the S to wait for the signal light before beginning each trial, and that he could discontinue responding at any time.

Following the instructions, E seated himself behind the screen and flashed S's signal light. Intertrial interval was 20 seconds and E recorded each response sequence attempted by S. The third different sequence was arbitrarily chosen as the goal response and reinforced with a nickel. Acquisition continued until a total of 20 goal responses (not necessarily in succession) were made.

After a total of 20 goal responses, all Ss were switched to one of three extinction conditions: nonreward, simultaneous reward-punishment,

or punishment only. In the nonreward condition nickel rewards were discontinued for making goal responses. Completing the goal response resulted in the simultaneous administration of a nickel and shock in the reward-punishment condition. In the punishment only condition, the goal response was punished with a shock and no reward was given. The dependent variable was the number of goal responses the S made before he chose to discontinue responding. An upper limit of 90 opportunities to make the goal response was set by E.

Results

No significant differences were found for number of trials to criteria during acquisition between the alcoholic and the nonalcoholic groups. Table 1 presents the mean number of goal responses during extinction for the two subject groups in each of the three experimental conditions. Table 2 presents the analysis of variance for these means. The analysis indicates that alcoholic subjects emitted significantly more goal responses in all conditions, compared to nonalcoholic controls ($p < .01$). Also observed were significant differences among treatment means which showed that the reward-punishment condition produced the greatest resistance to extinction whereas the nonreward and punishment conditions were the least resistant to extinction for all Ss.

Post hoc t tests revealed that alcoholics demonstrated significantly greater response persistence than control Ss in the punishment only condition ($p < .01$), and in the simultaneous reward-punishment condition ($p < .02$); no difference in responding was observed in the nonreward condition. These results support the hypothesis that alcoholics fail to suppress their responses to the same extent as nonalcoholics when punishment is made

contingent upon making a response. Figure 1 is a graphic presentation of group means for the number of goal responses following acquisition for each of the three experimental conditions.

Comparisons made across conditions showed that although the reward-punishment condition produced the greatest resistance to extinction for both the problem drinkers ($p < .01$) and the controls ($p < .01$), no significant differences were found between the punishment only and the nonreward condition for the alcoholics and the nonalcoholics respectively.

As shown in Figure 2, examination of goal responses over trials indicates that except in the nonreward condition, control subjects had a steeper extinction gradient than did the alcoholics. Figure 2 also indicates that in the first ten trials after criteria, the controls in the punishment only and in the reward-punishment condition made fewer goal responses than the alcoholics.

On the personality dimension of locus of control, contrary to expectations, no significant differences were found between alcoholics and control subjects. The mean score for the alcoholics was 9.20 (s = 3.41) and for the nonalcoholics was 8.67 (s = 2.86). Table 3 indicates that except for the condition in which alcoholics received punishment only ($p < .05$), no correlations between number of goal responses and external scores were significant.

Discussion

The main finding of this study was that following acquisition, alcoholics in the punishment only and in the reward-punishment condition failed to suppress their responses to the same extent as the nonalcoholic controls. This finding is consistent with the model proposed herein that alcohol can be viewed by the alcoholic as a discriminative stimulus with both negative

and positive properties. The anxiety associated with the sight of alcohol is mitigated by the alcohol drinking response, which is in turn relatively resistant to extinction because of the facilitating effects of anticipatory punishment responses. For the alcoholic subjects, the button pressing task used in the present study may have elicited similiar positive and negative cue properties. Perhaps the alcoholic subjects continued to press the buttons because of the anticipatory punishment responses conditioned to the stimuli (buttons) which preceded the previously reinforced goal response. Possibly because of a maladaptive learning history, alcoholics may have learned to anticipate more punishment than normals in conflict situations and thus are more resistant to extinction.

The task, intended to represent an analog to excessive drinking, demonstrated that when punishment or reward-punishment (conflict situations) were associated with a previously rewarded response, the alcoholics continued to respond to a greater extent than nonalcoholics. Only in nonconflict situations where drive level did not increase, as during acquisition and in the nonreward extinction condition, did alcoholics not differ from the controls. These results would argue against the notion that alcoholics in general are unable to respond to all feedback contingent upon their behavior. More specifically, the results indicate that alcoholics compared to social drinkers do not respond in the same manner to negative reinforcement.

An alternate approach to considering the phenomenon of excessive drinking would be Festinger's (1961) theory of cognitive dissonance. Dissonance theory might argue that subjects reduce the dissonance of punishment associated with a goal response by telling themselves that the hoped for eventual reward is indeed valuable and well worth persisting

for, in spite of the associated punishment. In terms of the present results, however, one would have to demonstrate that alcoholics had a greater need than nonalcoholics to reduce the dissonance associated with the task.

The finding that alcoholics and nonalcoholics did not differ on the personality dimension of locus of control is contrary to the hypothesis that alcoholics would have an internal orientation. The discrepancy between the results reported by Goss and Morosko (1970) that alcoholics do have an internal orientation, and those of the present study, may be due in part to Goss's failure to include a matched control group.

The conclusion that punishment is not an effective agent for the modification of behavior in alcoholics would seem to have a number of implications for treatment procedures. Treatment programs such as aversive conditioning in which the operant drinking response is paired with some noxious stimulus (electric shock; emetic drug) may actually facilitate the occurrence of maladaptive behavior since they may increase anxiety associated with the alcohol stimulus. One possibility for treatment would be to reinforce the alcoholic for controlled drinking which may have eventual effect of lowering their anxiety towards the sight of alcohol. Another possibility would be to positively reinforce cessation of drinking or resistance to temptation, rather than punishing the alcoholic for his behavior.

References

Banks, R. K. Persistence to continuous punishment and nonreward following training with intermittent punishment and nonreward. Psychonomic Science, 1966, 5, 105-106.

Banks, R. K. Persistence to continuous punishment following intermittent punishment training. Journal of Experimental Psychology, 1966, 71, 373-377.

Deur, J. L., & Parke, R. D. Resistance to extinction and continuous punishment in humans as a function of partial reward and partial punishment training. Psychonomic Science, 1968, 13, 91-92.

Festinger, L. The psychological effects of insufficient rewards. American Psychologist, 1961, 16, 1-11.

Goss, A., & Morosko, T. E. Relation between a dimension of internal external control and the MMPI with an alcoholic population. Journal of Consulting and Clinical Psychology, 1970, 34, 189-192.

Martin, B. Reward and punishment associated with the same goal response: a factor in the learning of motives. Psychological Bulletin, 1963, 60, 441-451.

Martin, B., & Ross, L. E. Affects of consummatory response punishment on consummatory and runway behavior. Journal of Comparative and Physiological Psychology, 1964, 58, 243-247.

Masserman, J. H., & Yum, K. S. An analysis of the influence of alcohol on experimental neurosis in cats. Psychosomatic Medicine, 1946, 8, 36-52.

Menaker, T. Anxiety about drinking in alcoholics. Journal of Abnormal Psychology, 1967, 72, 43-49.

Parke, R. D., Deur, J. L., & Sawin, D. B. The intermittent punishment effect in humans: Conditioning or adaption? Psychonomic Science, 1970, 18, 193-194.

Rotter, J. B. Generalized expectancies for internal versus external control of reinforcement. Psychological Monographs, 1966, 80, (1 Whole No. 609)

Smart, R. G. Effects of alcohol on conflict and avoidance behavior. Quarterly Journal of Studies on Alcohol, 1965, 26(2), 187-205. (a)

Smart, R. G. Conflict and conditioned aversive stimuli in the development of experimental neuroses. Canadian Journal of Psychology, 1965, 19, 208-223. (b)

Smart, R. G. Alcohol consumption and anxiety in college students. The Journal of General Psychology, 1968, 78, 35-39.

Sutherland, E. A., Schroeder, H. G., & Tordella, C. L. Personality traits and the alcoholic. Quarterly Journal of Studies on Alcohol, 1950, 11, 547-561.

Vogel-Sprott, M., & Banks, R. K. The effect of delayed punishment on an immediately rewarded response in alcoholics and nonalcoholics. Behavior Research and Therapy, 1965, 3, 69-73.

Walton, H. J. Personality as a determinant of the form of alcoholism. British Journal of Psychiatry, 1968, 114(51), 761-766.

Appendix A

Instructions:

You are going to have a test of perceptual motor skill, and at some time during the experiment you may experience a slight electric shock from the electrodes placed on your fingers. This shock is absolutely harmless and will never be any stronger than that which you just received.

Here is the test. In front of you, you will see an apparatus with three buttons. If you press the buttons in a particular order, you will receive a reward. We are interested in finding out how quickly you can learn the correct sequence. You may begin to press the buttons whenever the light in the corner flashes on. You make three different responses in any sequence, but only three and then you must wait until you see the next flash. Press slowly and firmly on the buttons, and be sure to wait until the light comes on before beginning each sequence. I do not know if you will receive shock during the experiment since this has been determined automatically. If at any time you wish to terminate the experiment simply depress the first button four times. Are there any questions? (Instructions adapted from Vogel-Sprott and Banks, 1965.)

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Table 1

Mean Number of Goal Responses

Group	Nonreward	Punishment	Reward-Punishment
Alcoholic	25.5	36.8	87.5
Normals	17.0	8.5	65.8

Table 2

Analysis of Variance for Treatment Means

Source	SS	df	MS	F
A (Group)	5704	1	5704	15.8*
B (Treatment)	39914	2	19957	55.2*
A x B	1016	2	508	1.4
Error	19515	54	361	

*p <.10

Table 3

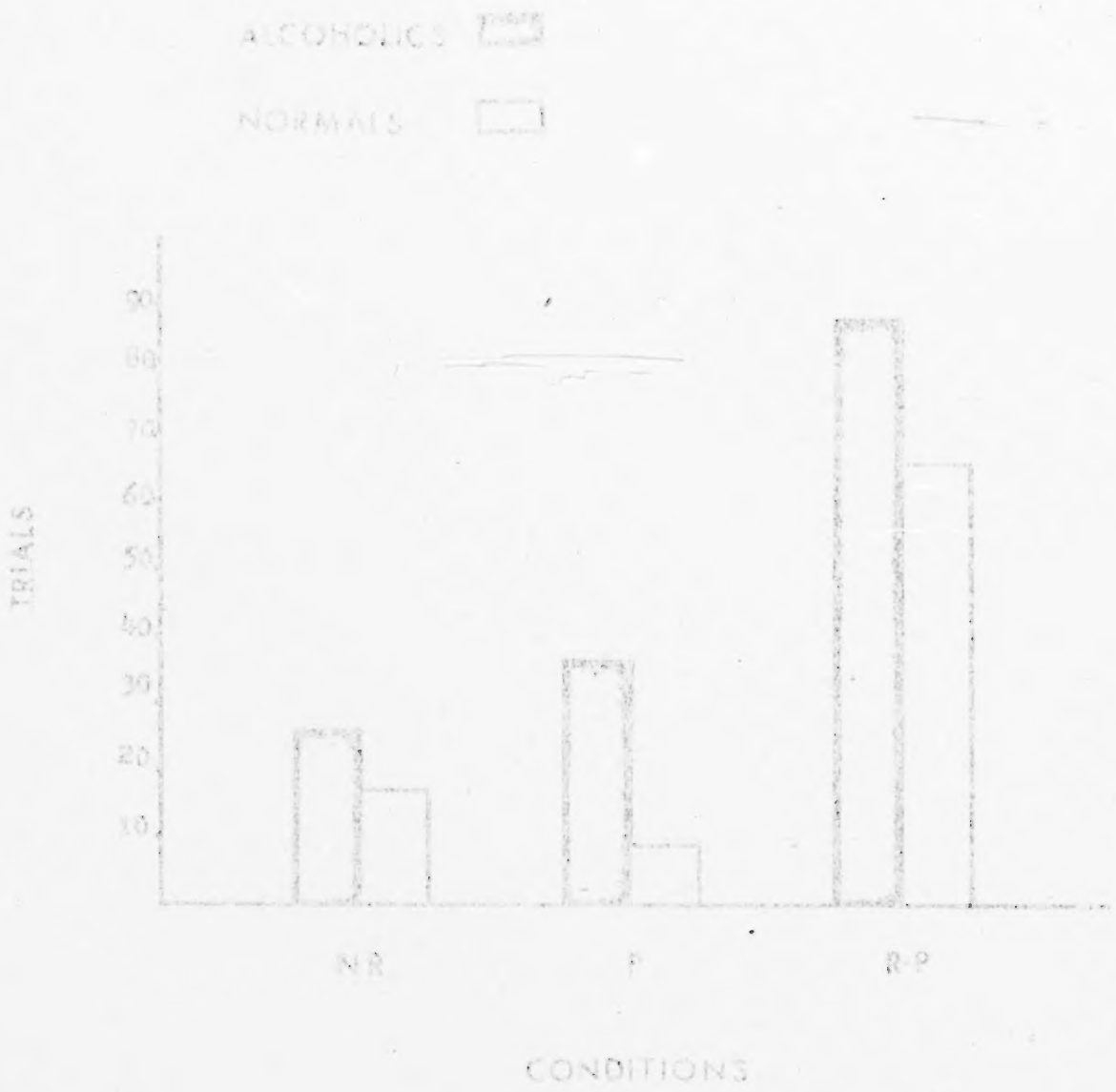
Correlation Matrix for Number of Goal Responses and External Scores

GROUP	CONDITION	CORRELATION	t
Alcoholic	N-R	-.15	.43
Alcoholic	P	+.67	2.56*
Alcoholic	R-P	-.39	1.20
Alcoholic	ALL[a]	+.01	.04
Normal	N-R	-.01	.04
Normal	P	-.04	.11
Normal	R-P	+.35	1.05
Normal	ALL[b]	-.12	.34

NOTE: N-R refers to the nonreward condition, P to the punishment only condition and R-P to the simultaneous reward-punishment condition.

a All conditions combined for alcoholics.
b All conditions combined for normals.
* $p<.05$

FIGURE 1


ALCOHOLICS
NORMALS
TRIALS
90
80
70
60
50
40
30
20
10
NR
P
R-P
CONDITIONS

D